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STM Study of Nb Clusters on Ag(110)

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The initial growth mode of Nb on Ag(110) in sub-monolayer region is studied using Scanning Tunneling Microscopy. E-beam evaporated Nb is deposited onto the substrate at RT, and STM measurements are carried out at RT and 78 K. With Nb being immiscible in bulk Ag, 3D islands formation begins at early stage and no particular ordered structure is found. At very low coverages, however, many interesting phenomena are observed in association with Nb clusters. Small Nb clusters as deposited displays very strong size dependence against atom-manipulation by the STM tip. In addition, the apparent corrugation of clusters below the critical size exhibits dramatic dependence on the imaging bias, disappearing completely over a wide range of the bias. Possible physical mechanism responsible for such behavior will be discussed.